

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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## NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(PCT Rule 71.1)

Date of mailing  
(day/month/year)

09.02.2006

Applicant's or agent's file reference

WO 21.1135

WL, FR

### IMPORTANT NOTIFICATION

International application No.

PCT/EP2005/002469

International filing date (day/month/year)

07.03.2005

Priority date (day/month/year)

16.03.2004

Applicant

SERVICES PETROLIERS SCHLUMBERGER et al.

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1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

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# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WO 21.1135		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/EP2005/002489		International filing date (day/month/year) 07.03.2005		Priority date (day/month/year) 16.03.2004
International Patent Classification (IPC) or national classification and IPC G01V326				
Applicant SERVICES PETROLIERS SCHLUMBERGER et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 13.10.2005		Date of completion of this report 09.02.2006		
Name and mailing address of the international preliminary examining authority.  European Patent Office D-60290 Munich Tel. +49 89 23699 - 5 Tx: 523666 epmu d Fax: +49 89 23990 - 4465		Authorized Officer  Thomas, J  Telephone No. +49 89 23699-		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2005/002469

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-29 as originally filed

**Claims, Numbers**

1-17 as originally filed

**Drawings, Sheets**

1/7-7/7 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing *(specify)*:
  - ☐ any table(s) related to sequence listing *(specify)*:
- \* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2005/002469

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	3-6,8,9,12-17
	No: Claims	1,2,7,10,11
Inventive step (IS)	Yes: Claims	
	No: Claims	1-17
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

Cited documents:

Reference is made to the following documents:

D1: ZHENYA ZHU ET AL.: 'Experimental studies of electrokinetic conversions in fluid-saturated borehole models' GEOPHYSICS, vol. 64, no. 5, September 1999 (1999-09), pages 1349-1356, XP002288589

D2: US 2003/038634 A1

D3: FR-A-2 836 557

D4: US-A-5 841 280

Lack of novelty (Art. 33(1.2) PCT)

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claims 1, 2, 7, 10 and 11** is not new in the sense of Article 33(2) PCT.

The subject-matter defined in the independent **claim 1** is anticipated by D1 for the following reasons:

The document discusses excessively the possibilities of a new borehole logging technique wherein electroseismic and seismoelectric borehole measurements are used in order to determine formation parameters. This document cites in particular in the last sentence of the abstract and the whole paragraph "Conclusions" the determination of formation parameters using electroseismic and seismoelectric measurements in combination. As a consequence, the subject-matter defined in the independent claim 1 is anticipated by this document.

The additional features defined in the dependent **claims 2, 7, 10 and 11** are also anticipated by D1, lacking therefore novelty contrary to the requirements of Art. 33(1.2) PCT:

**Claim 2:** p. 1350, right hand column, description of Fig. 1; p. 1354, left hand column, last

paragraph.

Claims 7, 10 and 11: p. 1350, left hand column, 3rd and 4th paragraph.

### **Lack of inventive step (Art. 33(1,3) PCT)**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claims 3-6, 8, 9 and 12-17** does not involve an inventive step in the sense of Article 33(3) PCT.

The subject-matter defined in the independent apparatus **claim 12** is not inventive for the following reasons:

D2, which is considered as the closest prior art for the subject-matter defined in claim 12, shows a logging tool comprising EM transmitter and receiver coils (33, 35, 48, 50), electrode assemblies (44-46), a seismic sensor (56) and surface acquisition and processing means (24, 54).

Hence, the logging tool known from D2 differs from the one defined in claim 12 only by the fact, that the source is not integrated in the logging tool, but installed at the earth's surface. In order to apply the combination of electroseismic and seismoelectric methods as cited in D1, it would be obvious for the skilled man to include a seismic source in the logging tool shown in D2, similarly to the well-known logging tool used for seismoelectric logging. An example therefor is shown in D3 (p. 12, l. 1-12). Hence, no inventive step can be seen to the subject-matter defined in the independent apparatus claim 12, contrary to the requirements of Art. 33(1,3) PCT.

All additional features defined in **claims 13-17** are anticipated by D2, which renders the subject-matter defined in claims 13-17 also not inventive in view of the teachings from D1 and D2 in combination with D3.

The additional features defined in the method claims 3-5, 8 and 9 are also not inventive (Art. 33(1,3) PCT). The reasons are detailed in the following:

**Claim 3:** The additional features are obvious in view of the teachings of D1 in combination with D4. D4 shows the combination of acoustic and seismoelectric measurements in order to derive additional information about the surrounding formation. On the basis of these

teachings it is obvious for the skilled man to use not only the converted seismoelectric or electrosismic wave measurements but also the non-converted measurements, as it is done in D4 with the acoustic waves. Hence, claim 3 can not provide an inventive contribution over the prior art.

**Claims 4 -6:** The inversion technique shown in D4 (claim 1; abstract l. 10-17; c. 2, l. 23-42), wherein a subsurface model of the surrounding formation is derived using an inversion technique wherein the synthesized data is optimized with respect to the measured data. In D4, the non-converted acoustic wave is also considered in the inversion technique. These teachings can be directly applied to the data measured in D1, in order to obtain an optimized subsurface model. In addition, D4 cites the electrokinetic coupling coefficient and the mobility (c. 5, l. 3-20; c. 6, l. 2-3) as important parameters for the electrokinetic mechanism. The teachings concerning the electrokinetic coupling coefficient and the mobility are also shown and discussed in D3 (p. 5, l. 3-22).

**Claims 8 and 9:** The use of seismomagnetic or magnetoseismic signals is discussed in D3 (p. 4, l. 15-29), these features can therefor not provide an inventive contribution over the prior art.